

Claims

1. A method for validating an authorization for locking and unlocking and/or using an object such as in particular a motor vehicle, comprising the steps of:

- sending out a request signal by at least one transmit and receive unit at the initiation of a control device, and
- if a moving and in particular portable code generator receives this request signal, sending back a reply signal,
- analyzing said reply signal being by the control device following receipt in the transmit and receive unit, and
- if an authorization is present and confirmed, outputting by the control device at least one control command in the object or motor vehicle, depending on a relevant distance of the code generator from the object or motor vehicle and depending on a location in a relevant detection zone around the object or motor vehicle,
- carrying out a series of distance measurements,
- calculating an associated quality value by a mathematical function in each case for the measuring results of said distance measurements, wherein only those measured values which fall below a certain quality value as a threshold value are generally accepted for an analysis in respect of initiating a distance-related function.

2. The method as claimed in Claim 1, wherein a large amount of data is recorded for a distance measurement, said data being approximated by a straight line, wherein an algorithm in accordance with the method of smallest error squares is used for estimating the parameters of said straight line, and in particular points with greater deviation from the mean value are restrictively weighted by a factor Sigma, and the quality measure is the robust estimate of Sigma.

3. The method as claimed in Claim 1, wherein the quality value is predetermined as a selection criterion and is itself selected depending on a distance and/or a position of a relevant code generator relative to the object.
4. The method as claimed in Claim 1, wherein at least one threshold for such a quality examination is specified from a relevant distance, position and/or area of a code generator relative to the object or motor vehicle.
5. The method as claimed in Claim 1, wherein a level measurement for each individual measured value is carried out in combination with the method for a quality definition.
6. The method as claimed in Claim 1, wherein a level measurement and a selection of measured values of the quality definition are carried out beforehand, said selection being based on a limit value.
7. The method as claimed in Claim 1, wherein an analysis of mean value and scattering and an elimination of "outliers" are performed in order further to increase the reliability of the distance definition.
8. The method as claimed in Claim 1, wherein the range of variation is reduced further using known mathematical methods of adaptation and statistics.
9. The method as claimed in Claim 1, wherein a KALMAN filter technique is applied to the distance measurements.

10. A security apparatus for validating an authorization for locking and unlocking and/or using an object such as in particular a motor vehicle, comprising a control device and a memory arranged in the object, said control device being connected to at least one transmit and receive unit, wherein the transmit and receive unit is operable to transmit a request signal to a remote code generator when initiated by the control device, wherein the control device is further operable to calculate a distance of the code generator to the respective transmit and receive unit and operable to determine an authorization, wherein if an authorization is present and confirmed depending on a relevant distance of the code generator from the object or motor vehicle and depending on a location in a relevant detection zone around the object or motor vehicle, at least the control device is operable to output a control command in the object or motor vehicle, wherein the apparatus comprises means to analyze a reply signal from the code generator, and means to calculate an associated quality value by a mathematical function in each case for the measuring results of said distance measurements, wherein only those measured values which fall below a certain quality value as a threshold value are generally accepted for an analysis in respect of initiating a distance-related function and wherein adjustment parameters and threshold values for the quality criterion and/or a level are permanently stored in the memory of the security apparatus.

11. The security apparatus as claimed in claim 10, wherein the additional hardware which is required in relation to known systems is essentially included in the control device.

12. A security system for validating an authorization for locking and unlocking and/or using an object such as in particular a motor vehicle, comprising:

- a control unit arranged in said object;
- at least one transmit and receive unit arranged in said object and coupled with the control unit;
- a mobile code generator;
- wherein said control unit can trigger said at least one transmit and receive unit to send out a request signal, and
- wherein the control unit comprises
 - authentication means to authenticate a reply signal sent from said code generator,
 - distance measurement means to determine a distance of said code generator and said transmit and receive unit, and
 - calculating means for determining an associated quality value by a mathematical function in each case for the measuring results of said distance measurements, wherein only those measured values which fall below a certain quality value as a threshold value are generally accepted for an analysis in respect of initiating a distance-related function.

13. The security system as claimed in Claim 12, further comprising a memory coupled with said control unit.

14. The system as claimed in Claim 13, wherein adjustment parameters and threshold values for the quality criterion and/or a level are permanently stored in the memory.

15. The security system as claimed in Claim 12, wherein said means for measuring the distance record a large amount of data, said data being approximated by a straight line, wherein an algorithm in accordance with the method of smallest error squares is

used for estimating the parameters of said straight line, and in particular points with greater deviation from the mean value are restrictively weighted by a factor Sigma, and the quality measure is the robust estimate of Sigma.

16. The security system as claimed in Claim 12, wherein the quality value is predetermined as a selection criterion and is itself selected depending on a distance and/or a position of a relevant code generator relative to the object.

17. The security system as claimed in Claim 12, wherein at least one threshold for such a quality examination is specified from a relevant distance, position and/or area of a code generator relative to the object or motor vehicle.

18. The security system as claimed in Claim 12, wherein a level measurement for each individual measured value is carried out in combination with the method for a quality definition.

19. The security system as claimed in Claim 12, wherein a level measurement and a selection of measured values of the quality definition are carried out beforehand, said selection being based on a limit value.

20. The security system as claimed in Claim 12, wherein an analysis of mean value and scattering and an elimination of "outliers" are performed in order further to increase the reliability of the distance definition.